Gregor Mendel Biography

Botanist, Scientist (1822–1884)

Quick Facts

Name
: Gregor Mendel

Occupation
: Botanist, Scientist

Birth Date
: July 22, 1822

Death Date
: January 6, 1884

Education
: University of Vienna, University of Olmütz

Place of Birth
: Heinzendorf, Austria

Place of Death
: Brno, Austria

Originally
: Johann Mendel

Nickname
: "Father of Modern Genetics"
: "Father of Genetics"

AKA
: Gregor Mendel

Full Name
: Gregor Johann Mendel

Gregor Mendel was an Austrian monk who discovered the basic principles of heredity through experiments in his garden. Mendel's observations became the foundation of modern genetics and the study of heredity, and he is widely considered a pioneer in the field of genetics.

Synopsis

Gregor Mendel, known as the "father of modern genetics," was born in Austria in 1822. A monk, Mendel discovered the basic principles of heredity through experiments in his monastery's garden. His experiments showed that the inheritance of certain traits in pea plants follows particular patterns, subsequently becoming the foundation of modern genetics and leading to the study of heredity.

Early Life

Gregor Johann Mendel was born Johann Mendel on July 22, 1822, to Anton and Rosine Mendel, on his family's farm, in what was then Heinzendorf, Austria. He spent his early youth in that rural setting, until age 11, when a local schoolmaster who was impressed with his aptitude for learning recommended that he be sent to secondary school in Troppau to continue his education. The move was a financial strain on his family, and often a difficult experience for Mendel, but he excelled in his studies, and in 1840, he graduated from the school with honors.

Following his graduation, Mendel enrolled in a two-year program at the Philosophical Institute of the University of Olmütz. There, he again distinguished himself academically, particularly in the subjects of physics and math, and tutored in his spare time to make ends meet. Despite suffering from deep bouts of depression that, more than once, caused him to temporarily abandon his studies, Mendel graduated from the program in 1843.

That same year, against the wishes of his father, who expected him to take over the family farm, Mendel began studying to be a monk: He joined the Augustinian order at the St. Thomas Monastery in Brno, and was given the name Gregor. At that time, the monastery was a cultural center for the region, and Mendel was immediately exposed to the research and teaching of its members, and also gained access to the monastery's extensive library and experimental facilities.

In 1849, when his work in the community in Brno exhausted him to the point of illness, Mendel was sent to fill a temporary teaching position in Znaim. However, he failed a teaching-certification exam the following year, and in 1851, he was sent to the University of Vienna, at the monastery's expense, to continue his studies in the sciences. While there, Mendel studied mathematics and physics under Christian Doppler, after whom the Doppler effect of wave frequency is named; he studied botany under Franz Unger, who had begun using a microscope in his studies, and who was a proponent of a pre-Darwinian version of evolutionary theory.

In 1853, upon completing his studies at the University of Vienna, Mendel returned to the monastery in Brno and was given a teaching position at a secondary school, where he would stay for more than a decade. It was during this time that he began the experiments for which he is best known.

Experiments and Theories

Around 1854, Mendel began to research the transmission of hereditary traits in plant hybrids. At the time of Mendel's studies, it was a generally accepted fact that the hereditary traits of the offspring of any species were merely the diluted blending of whatever traits were present in the "parents." It was also commonly accepted that, over generations, a hybrid would revert to its original form, the implication of which suggested that a hybrid could not create new forms. However, the results of such studies were often skewed by the relatively short period of time during which the experiments were conducted, whereas Mendel's research continued over as many as eight years (between 1856 and 1863), and involved tens of thousands of individual plants.

Mendel chose to use peas for his experiments due to their many distinct varieties, and because offspring could be quickly and easily produced. He cross-fertilized pea plants that had clearly opposite characteristics—tall with short, smooth with wrinkled, those containing green seeds with those containing yellow seeds, etc.—and, after analyzing his results, reached two of his most important conclusions: the Law of Segregation, which established that there are dominant and recessive traits passed on randomly from parents to offspring (and provided an alternative to blending inheritance, the dominant theory of the time), and the Law of Independent Assortment, which established that traits were passed on independently of other traits from parent to offspring. He also proposed that this heredity followed basic statistical laws. Though Mendel's experiments had been conducted with pea plants, he put forth the theory that all living things had such traits.

In 1865, Mendel delivered two lectures on his findings to the Natural Science Society in Brno, who published the results of his studies in their journal the following year, under the title *Experiments on Plant Hybrids*. Mendel did little to promote his work, however, and the few references to his work from that time period indicated that much of it had been misunderstood. It was generally thought that Mendel had shown only what was already commonly known at the time—that hybrids eventually revert to their original form. The importance of variability and its evolutionary implications were largely overlooked. Furthermore, Mendel's findings were not viewed as being generally applicable, even by Mendel himself, who surmised that they only applied to certain species or types of traits. Of course, his system eventually proved to be of general application and is one of the foundational principles of biology.

Later Life and Legacy

In 1868, Mendel was elected abbot of the school where he had been teaching for the previous 14 years, and both his resulting administrative duties and his gradually failing eyesight kept him from continuing any extensive scientific work. He traveled little during this time, and was further isolated from his contemporaries as the result of his public opposition to an 1874 taxation law that increased the tax on the monasteries to cover Church expenses.

Gregor Mendel died on January 6, 1884, at the age of 61. He was laid to rest in the monastery's burial plot and his funeral was well attended. His work, however, was still largely unknown.

It was not until decades later, when Mendel's research informed the work of several noted geneticists, botanists and biologists conducting research on heredity, that its significance was more fully appreciated, and his studies began to be referred to as Mendel's Laws. A team of botanists independently duplicated Mendel's experiments and results in 1900, finding out after the fact, allegedly, that both the data and the general theory had been published in 1866 by Mendel. Questions arose about the validity of the claims that the trio of botanists were not aware of Mendel's previous results, but they soon did credit Mendel with priority. Even then, however, his work was often marginalized by Darwinians, who claimed that his findings were irrelevant to a theory of evolution. As genetic theory continued to develop, the relevance of Mendel's work fell in and out of favor, but his research and theories are considered fundamental to any understanding of the field, and he is thus considered the "father of modern genetics."